

Tuesday 12 January 2021 – Morning

Level 3 Cambridge Technical in Sport and Physical Activity

05826/05827/05828/05829/05872 Unit 1: Body systems and the effects of physical activity

Time allowed: 1 hour 30 minutes

C400/2101



You can use:

- a calculator

Please write clearly in black ink.

Centre number

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Candidate number

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First name(s)

Last name

Date of birth

D	D	M	M	Y	Y	Y	Y
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INSTRUCTIONS

- Use black ink. You can use an HB pencil, but only for graphs and diagrams.
- Write your answer to each question in the space provided. If you need extra space use the lined pages at the end of this booklet. The question numbers must be clearly shown.
- Answer **all** the questions.
- Where appropriate, your answer should be supported with working. Marks might be given for using a correct method, even if your answer is wrong.

INFORMATION

- The total mark for this paper is **70**.
- The marks for each question are shown in brackets [].
- Quality of written communication will be assessed in questions marked with an asterisk (*).
- This document has **20** pages.

ADVICE

- Read each question carefully before you start your answer.

FOR EXAMINER USE ONLY

Question No	Mark
Section A: 1-10	/10
Section B: 11	/5
12	/5
13	/5
14	/6
15	/5
16	/5
17	/8
18	/4
19	/3
20	/4
Section C: 21	/10
Total	/70

Section A

Answer **all** the questions. Put a tick (✓) in the box next to the **one** correct answer for each question.

1 Which one of the following muscles causes flexion at the shoulder?

(a) Latissimus dorsi

(b) Deltoid

(c) Pronator teres

(d) Trapezius

[1]

2 Which one of the following is **not** an expected value for cardiac output during exercise?

(a) 5 litres/minute

(b) 10 litres/minute

(c) 15 litres/minute

(d) 20 litres/minute

[1]

3 Which one of the following statements about gaseous exchange at the alveoli is correct?

(a) In alveoli ppO_2 is high and $ppCO_2$ is high

(b) In alveoli ppO_2 is low and $ppCO_2$ is high

(c) In capillaries ppO_2 is high and $ppCO_2$ is low

(d) In capillaries ppO_2 is low and $ppCO_2$ is high

[1]

4 Which one of the following is **not** a short-term effect of exercise on the muscular system?

(a) Increase in glycogen stores

(b) Increase in lactic acid

(c) Increase in blood flow

(d) Decrease in phosphocreatine

[1]

5 What type of bone is the patella?

(a) Flat

(b) Short

(c) Sesamoid

(d) Irregular

[1]

6 Which one of the following blood vessels carries blood at the lowest pressure?

(a) Arteries

(b) Arterioles

(c) Venules

(d) Veins

[1]

7 Which one of the following is **not** a fixator muscle during a biceps curl?

(a) Deltoid

(b) Triceps brachii

(c) Trapezius

(d) Teres major

[1]

8 Which one of the following bones is part of the appendicular skeleton?

(a) Sternum

(b) Scapula

(c) Cranium

(d) Coccyx

[1]

9 State the long-term effect of regular exercise on maximum minute ventilation.

.....[1]

10 Identify **one** of the three stages of the aerobic system.

.....[1]

Section B

Answer **all** the questions.

11 Fig. 11 shows an image of the vertebral column.

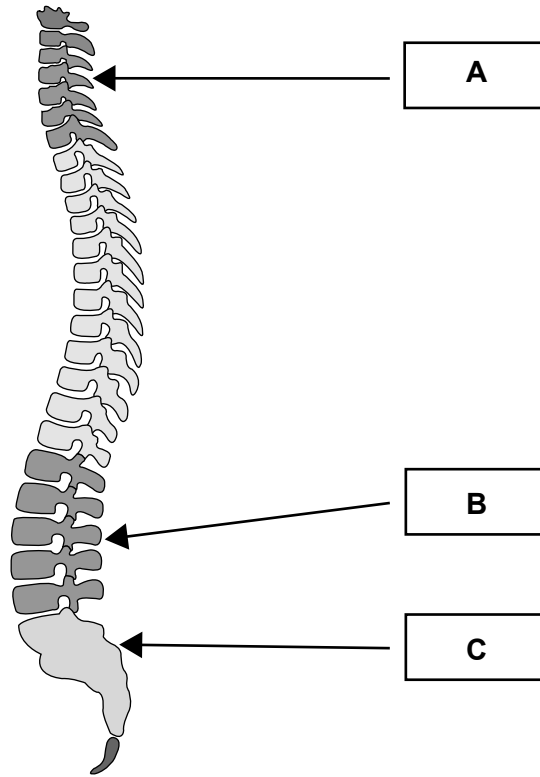


Fig. 11

(a) Identify the sections of the vertebral column, labelled **A**, **B** and **C**.

A

B

C

[3]

(b) Describe **two** functions of the vertebral column.

1

.....

2

.....

[2]

12 Fig. 12.1 shows an image of a synovial joint.

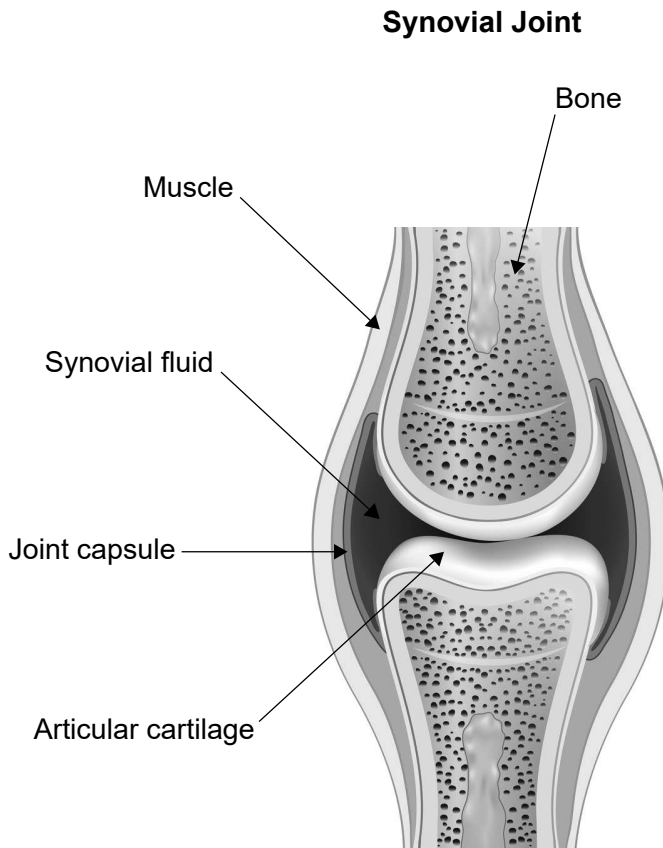


Fig. 12.1

(a) Describe the functions of the following structures of a synovial joint.

Synovial fluid

.....

Joint capsule.....

.....

[2]

13 Complete the table below to identify the joint movements described.

Movement	Description	Practical example
.....	Increasing the angle at a joint.	Movement at elbow while throwing a ball.
.....	Moving a limb towards the mid-line of the body.	Movement at shoulder as arms move down during a star jump.
.....	Bending the spine to the side.	Movement at spine while bowling in cricket.
.....	Rotating a limb outwards about its longitudinal axis.	Movement at hip to perform a side-footed pass in football.
.....	Rotating the radio-ulnar joint so that palm faces upward.	Turning the hand to throw a ball underarm.

[5]

14 Fig. 14 shows the performance of a sit up.



Fig. 14

Complete the paragraph below to explain how muscles function during a sit up.

During the upward phase of the sit up, the agonist is the
muscle.

The type of contraction in this muscle is

The antagonist muscle is the

If the performer holds their position still for a time before the downward movement the
type of contraction in the working muscle is

During the downward phase the agonist is the
muscle.

The type of contraction in this muscle is

[6]

15 Fig. 15 shows the order of muscle fibre use as exercise intensity increases.

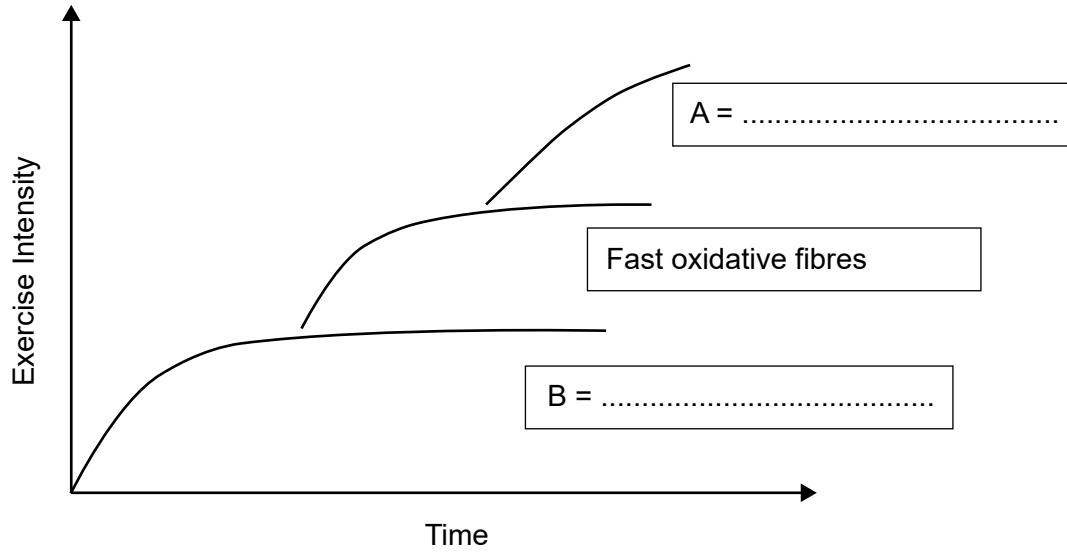


Fig. 15

(a) Label the muscle fibre types **A** and **B** in the boxes on the diagram.

[2]

(b) Explain how increasing the intensity of exercise affects muscle fibre type use.

.....

.....

.....

.....

.....

.....

.....

.....

[3]

16 Fig. 16 shows a diagram of the heart.

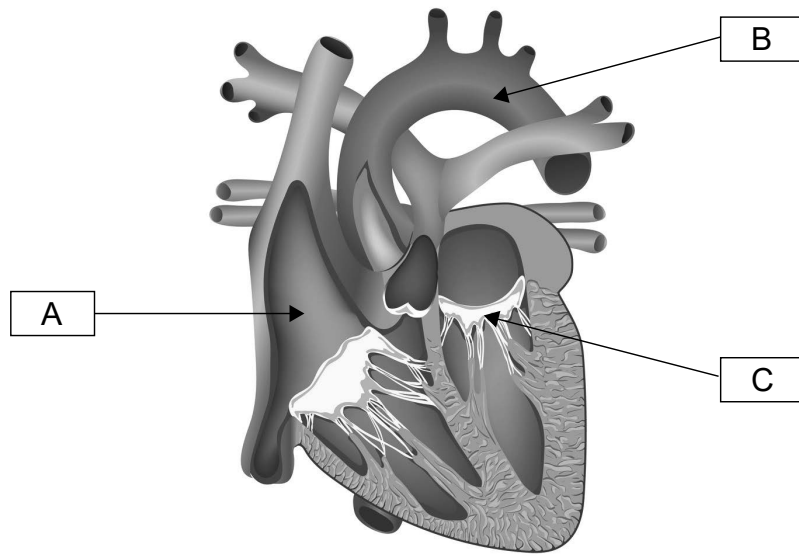


Fig. 16

(a) Identify the structures labelled **A**, **B** and **C**.

A

B

C

[3]

(b) Explain the functions of **B** and **C**.

B

.....

C

.....

[2]

17 (a) Complete the table below describing the structures of the lungs and their roles.

Structure of lungs	Role
.....	Branch off from the trachea to the left and right lungs.
Alveoli	Sites where gaseous exchange takes place.
.....	Warms, moistens and filters air from the atmosphere.
Epiglottis

[3]

(b) Complete the paragraph below which describes the mechanics of breathing during expiration.

The diaphragm and the external intercostal muscles

The internal intercostal muscles

This causes the ribs to move

The volume of the thoracic cavity

This means that pressure in the lungs

As a result, air is forced out of the lungs.

[5]

18 Define the following terms, and state an average resting value for each.

Breathing frequency.....

.....

Average resting value

Tidal volume.....

.....

Average resting value

[4]

19 Fig. 19 shows a flow chart to represent the lactic acid system.

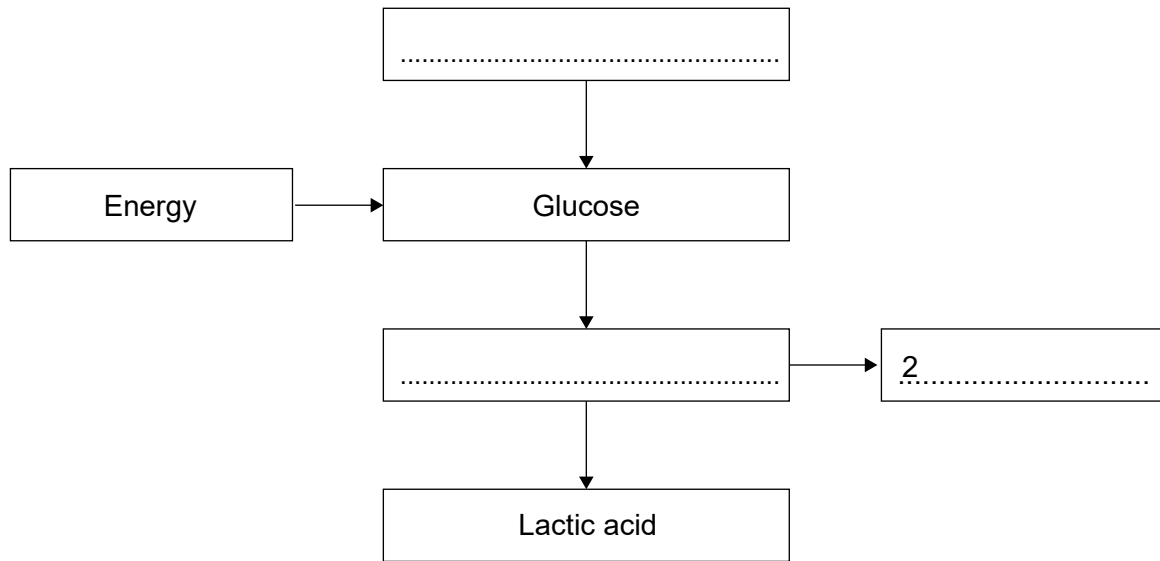


Fig. 19

Complete the flow chart by filling in the missing words.

[3]

20 Fig. 20 is a bar chart showing the contribution of different energy systems for a marathon runner and a games player. The games player's bar is incomplete.

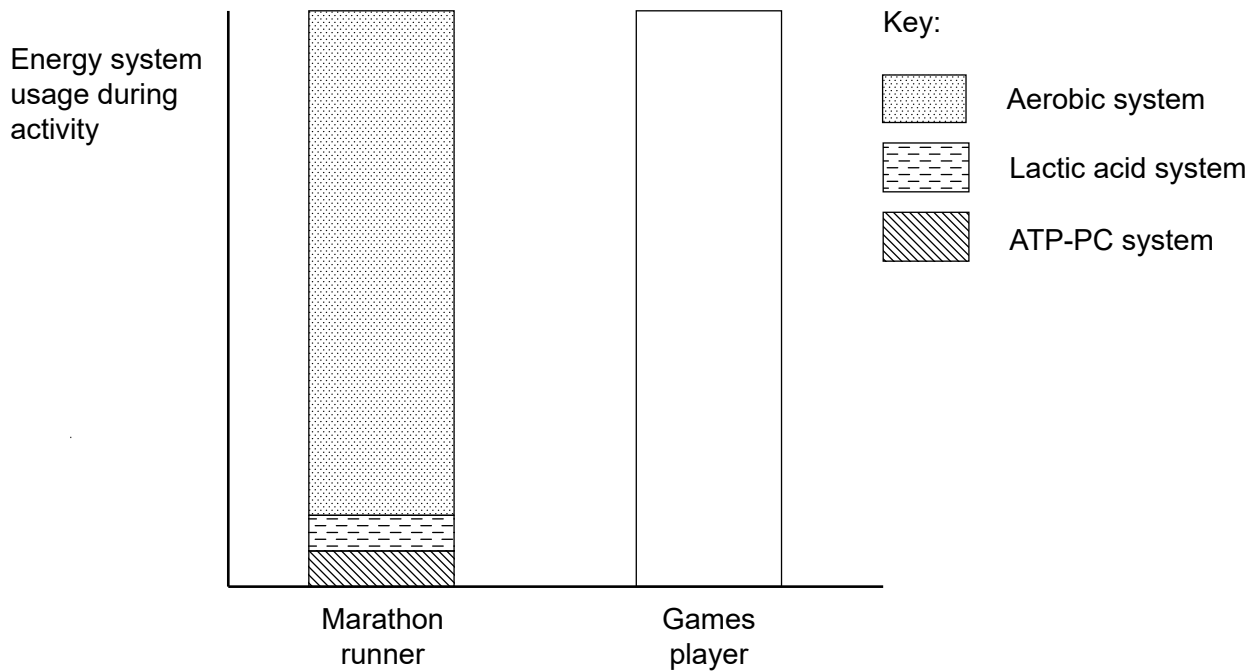


Fig. 20

(a) Identify a games activity of your choice below, and indicate on the bar chart the energy system usage of a player in that game.

Game.....

[1]

(b) Using the same games activity from **20 (a)**, describe a practical situation that would predominantly use the following energy systems:

ATP-PC system

.....

Lactic acid system

.....

Aerobic system

.....

[3]

ADDITIONAL ANSWER SPACE

If additional answer space is required, you should use the following lined pages. The question numbers must be clearly shown in the margins – for example, 11(a) or 12(b).

A vertical line on the left side of the page is followed by 25 horizontal dotted lines, providing a ruled area for writing answers.

A series of horizontal dotted lines for writing, spanning the width of the page.

A series of horizontal dotted lines for writing, spanning the width of the page.

A series of horizontal dotted lines for writing, spanning the width of the page.



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